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BLACK SPOT OF ROSES

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The black spot disease causes severe injury to roses in most portions of the United States and Europe, and probably occurs wherever roses are grown. The disease is widespread in Florida, and for the most part is active throughout the entire year. Although the nature and extent of black spot injury varies according to the weather, location of the planting, type of growth and varieties involved, it often becomes very destructive. Varieties differ greatly in susceptibility to black spot, but under conditions favorable to the disease most of the better cut-flower sorts are seriously affected.

CAUSE

Black spot is caused by a parasitic fungus[1], and like most disease-causing organisms this fungus is microscopic in size. In its development on the rose leaf it manifests two stages, an active summer spore stage and an inactive winter spore stage. It is the summer spore stage which spreads the disease from leaf to leaf and from plant to plant during the growing season and causes defoliation. Temperatures permitting, this stage of the fungus persists throughout the entire year. The winter spore stage develops in dead, infected leaves which have fallen to the ground, and with the return of warm temperatures the spores are liberated and serve to reintroduce the disease.

SYMPTOMS

The disease is recognized by the presence of black spots on the leaves, and by premature yellowing and defoliation. The spots are more or less circular, black in color, have irregularly fringed margins, attain a size of one-half inch or more in diameter, and appear on the upper surface of the leaves as well as on the leaf petioles. The leaf tissue surrounding the spots usually turns yellow, although during moist weather following abundant infection all the leaves of entire plants may drop before yellowing occurs.

CONTROL

Control methods for black spot should begin with setting of the plants. Every possible step should be taken to see that wet foliage dries promptly. Thus, plants should be spaced far enough apart to permit free circulation of air; they should be set away

[1] *Diplocarpon rosae* Wolf.

from walls or buildings; they should be pruned to an open habit of growth. The raking up and burning of fallen foliage will be helpful in black spot control, and the more frequently this is done the better. If a mulch is used beneath the plants, its character should be considered with this practice in mind. Finally, a suitable fungicide must be applied at frequent intervals.

Several points enter into the selection of the fungicide. It should be effective against black spot (if possible, against other rose diseases as well), non-injurious to the plant, inconspicuous on the foliage, should spread and adhere well, and should be accessible, inexpensive, easily prepared and applied. Few materials, whether home-made or proprietary, do more than satisfy part of these requirements. A consideration of these various qualities will serve as a guide in selecting the fungicide.

Both copper and sulfur fungicides have been found of value in combatting black spot. However, the sulfurs must be eliminated for year-around application due to serious burning of the foliage when applied during hot weather. The coppers seldom cause burning when properly prepared and applied. Bordeaux mixture, the most widely used of all copper compounds, has given good black spot control. Bordeaux coats the plants with an unsightly residue, however, and it has been found that frequent applications adversely affect growth of the plants. Flordo[2], another effective home preparation, may be substituted for bordeaux mixture. This spray covers and adheres well, leaves little conspicuous residue, and is helpful in combatting aphids and other rose pests. Ammoniacal copper carbonate, likewise a "stainless" fungicide, has proved less effective for black spot control.

Many proprietary copper compounds are available. A few of the more prominent were tested in an experimental garden at Leesburg, including basic copper chloride, copper silicate, basic copper sulfate, and red copper oxide. A wetting agent must be added to each of these materials if not already included. Basic copper chloride gave best disease control, but left a conspicuous residue deposit on the plants. Red copper oxide spray proved superior in respect to coverage and the small amount of noticeable residue. Copper-lime dust was found less effective than the better sprays. However, where density of the foliage interferes with good coverage, dusts may be used to advantage. An alternation of dust and spray may be followed, applying each every second application.

The fungicide should be applied at about weekly intervals during most of the year, frequent applications being particularly necessary during periods of rain, fog, or heavy dews. The fungicide may be applied at any time of the day, although it is best to avoid mid-portions of hot days. It makes little difference whether the foliage is dry or moist, but dry foliage permits better coverage with dusts. It is particularly important to coat all new growth promptly.

[2]Bluestone, soap, and ammonia spray (See Florida Agricultural Experiment Station Press Bulletin 504). Inexpensive soaps permitting elimination of ammonia are now available.